

REMARKS

This Amendment is being filed in response to the Office Action dated May 21, 2003. For the following reasons, this Application should be considered in condition for allowance and the case passed to issue.

The drawings were objected to as failing to comply with 37 C.F.R. §1.84(p)(5) for failing to include reference signs not mentioned in the description. This objection has been overcome by the amendments made to Figs. 4 and 5 to change reference 2 to reference numeral 14, in conformance with the description in the specification. Further, Fig. 1 has been designated by the legend "Prior Art", as required by the Examiner. Finally, the equations contained in steps ST3, ST4 and ST7 have been corrected to conform to the specification.

For all of the above reasons, withdrawal to the objections to the drawings are respectfully requested.

The disclosure was objected to because of informalities that have now been corrected by the amendments contained herein. Reconsideration and withdrawal of the objection to the disclosure are respectfully requested.

Claim 8 was objected to because of an informality alleged by the Examiner. In particular, the Examiner stated that claim 8 recited the limitation "the coupling capacitor" on lines 5 and 8, for which there was no antecedent basis. However, it is respectfully pointed out that the term "the coupling capacitor" was provided with proper antecedent basis by the term "a coupling capacitor" recited in line 3 of claim 1. Accordingly, this rejection is hereby traversed and reconsideration and withdrawal thereof are respectfully requested.

Claims 1-4 and 6-8 were rejected under 35 U.S.C. 102(e) as being anticipated by Tamesue et al. (hereafter Tamesue). This rejection is hereby traversed and reconsideration and

withdrawal thereof are respectfully requested. The following is a comparison of the present invention as claimed with the Tamesue reference.

The invention relates to a ground detection apparatus for an electric vehicle having DC power supply circuit that is electrically insulated from a body of a vehicle. A coupling capacitor is connected to the DC power supply unit. A detection signal generator outputs a ground detection signal comprising a periodical waveform. This detection signal generator is connected to one terminal of the coupling capacitor through a detection resistor. A signal detector detects a voltage amplitude of one terminal of a coupling capacitor. A converter converts the detected voltage amplitude into an insulation resistance on the basis of the relationship between a preset voltage amplitude and a preset insulation resistance. A level detector detects levels of insulation resistance deterioration of the DC power supply circuit by comparing the converted insulation resistance with a preset ground decision threshold value.

Hence, the present invention employs a detection signal generator connected to a terminal of a coupling capacitor through a detection resistor and a signal detector detecting a voltage amplitude of the coupling capacitor. The detected voltage V_a is converted into an insulation resistance R_L by using equations 3, 6 and 9, for example, as described in the specification. The insulation resistance R_L is compared with the predetermined threshold value. Hence, the detection resistor is therefore an integral element in the present invention and cannot be simply ignored or reduced to substantially zero so as to have no effect..

Tamesue, U.S. Patent No. 6,320,389, shows an electric leak detecting apparatus for electric motor cars and includes a detecting apparatus wherein an AC signal is applied between a vehicle body and battery 3A through a condenser (C_D) and a real part of an admittance is computed from amplitudes and phases of the detected voltage V and the current I , as shown in

Fig. 1. Thus, in Tamesue, the ground detection apparatus for the electric vehicle has to detect not only the voltage V , but also the current I in order to calculate the admittance.

It is required for establishing a case of anticipation under 35 U.S.C. 102 that the allegedly anticipating reference disclose identically each and every element of the claimed invention. The Examiner has not established that Tamesue discloses each and every element of the independent claims. For example, Tamesue needs to detect both the voltage V and the current I in order to calculate an insulation resistance. Hence, Tamesue fails to disclose a converter converting the detected voltage amplitude into an insulation resistance on the basis of the relationship between a preset voltage amplitude and a preset insulation. This can be particularly appreciated since the “wire” connecting a signal generator to a coupling capacitor will have practically zero resistance (R_0 is approximately 0Ω). The voltage V_a would be a constant value in such a circumstance and the insulation resistance could not be calculated by using the equations 3, 6, etc., as outlined by the present invention. The Examiner has not provided any indication as to how Tamesue can calculate the insulation resistance based upon a detection resistor with a practically 0Ω value.

Furthermore, the Examiner has not even established that there is a wire connecting the capacitor to the signal generator in Tamesue. Instead, the drawing of Fig. 1 is merely a schematic drawing, and does not show the capacitor being connected to the signal generator with a wire. A direct connection may be made without an intervening wire. In any event, a detection resistor as appreciated by those of ordinary skill in the art is not shown in Fig. 1. Those with skill in the art would understand a resistor, as seen in Fig. 1, to be that delineated by the common electrical symbols for resistance, such as the resistance of G_{leak} . Therefore, despite the Examiner's assertions that a wire connecting the signal generator to the coupling capacitor will

cause some resistance and therefore can be considered equivalent to a detection resistor, this assertion has no merit.

With respect to the rejections of claims 3 and 7, the Examiner is referred to Fig. 26. However, Fig. 26 of Tamesue depicts merely an altered embodiment of a lower portion of the drawing of Fig. 1. In this embodiment, as in that of Fig. 1, not only the voltage V but also the current I needs to be detected in order to calculate insulation resistance. Hence, the configuration of the apparatus taught by Tamesue in Fig. 26 is quite different from that provided for in claims 3 and 7 of the present invention.

Since Tamesue fails to disclose identically each and every element of claims 1-4 and 6-8, it cannot anticipate these claims under 35 U.S.C. 102. Reconsideration and withdrawal of the rejection of these claims under 35 U.S.C. 102 are therefore respectfully requested.

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Tamesue in view of Gaughan et. al. (hereafter Gaughan). This rejection is hereby traversed and reconsideration and withdrawal thereof are respectfully requested.

Gaughan, U.S. Patent No. 5,530,363, describes a DC ground fault detecting apparatus with an auto-null DC circuit in which a switch 18 is connected between a center tap 16 and a ground is periodically switched between on and off states to impose a square wave modulation on a ground current and a response current is detected by a Hall probe 21. This is described in column 2, line 65-column 3, line 24. It is also shown in Figs. 2 and 3. However, Gaughan fails to disclose any of the deficiencies noted with respect to Tamesue. Further, the Examiner has not established that there is any motivation to combine Gaughan with Tamesue, nor why voltage amplitude should be more easily measured employing the periodical waveform of a square

waveform as alleged to be taught by Gaughan. Hence, the rejection of claim 5 under 35 U.S.C. 103(a) should be reconsidered and withdrawn. Such action is respectfully requested.

In light of the Amendments and Remarks above, this Application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding this Amendment or the Application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the Application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY


John A. Hankins
Registration No. 32,029

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 JAH:idw
Facsimile: (202) 756-8087
Date: November 20, 2003